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| 10/536,775      | 01/23/2006  | Nigel Paul Schofield | M02B160             | 2847             |

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| EXAMINER |
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BOBISH, CHRISTOPHER S

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| ART UNIT | PAPER NUMBER |
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3746

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11/09/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

LORETTA.SANDOVAL@EDWARDSVACUUM.COM

|                              |                                       |  |  |
|------------------------------|---------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/536,775  | <b>Applicant(s)</b><br>SCHOFIELD, NIGEL PAUL |  |
|                              | <b>Examiner</b><br>CHRISTOPHER BOBISH | <b>Art Unit</b><br>3746                      |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/18/2009 has been entered.

### ***Response to Amendment***

The arguments filed on 09/18/2009 under 37 CFR 1.131 have been considered but are ineffective to overcome the Abbel, Stones and Maher references.

Claims 1-17 remain pending in the application.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 8 are unclear because the language "during *it's* normal operation" is not sufficiently clear as to whether the term "it's" refers to the evacuation means or the molecular pumping mechanism.

***Claim Rejections - 35 USC § 103***

Claims 1-3, 5-7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abbel (US Patent No. 6,446,651 B1) in view of Stones (US Patent No. 6,135,709).

Abbel teaches:

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limitations from claim 1, a vacuum pumping system (see FIG. 1) having a turbomolecular pump (3), including an evacuation means (4) to evacuate the turbomolecular pumping means prior to start up of the molecular pumping mechanism (C. 2 Lines 62-63), wherein the evacuation means is decoupled from the molecular pumping mechanism during its normal operation (see C. 2 Lines 24-31, which teaches that fore vacuums can be decoupled from high vacuum pumps; i.e. when chamber 2 is to be evacuated);

Abbel does not teach the specific structure of the turbomolecular vacuum pump, but Stones does.

Stones teaches:

limitations from claim 1, a molecular pumping mechanism (FIG. 3) comprising turbomolecular pumping means (50); a backing pumping mechanism (1), wherein a drive shaft (the shaft mounted on the rotor 9) driven by a motor (7 from FIG. 1) is for driving the molecular pumping mechanism and the backing mechanism (C. 2 Line 61 to C. 3 Line 20);

It would have been obvious to one of ordinary skill in the art of vacuum pumps at the time of the invention to use a compound vacuum pump as taught by Stones in the system as taught by Abbel in order to improve the operating range of pressures and throughput (see C. 1 Lines 4-7 of Stones). Furthermore, as Abbel already teaches a turbomolecular pump, it would be obvious to one of ordinary skill to substitute various pumps of this type to meet performance (i.e. pressure) demands.

Abbel and Stones disclose and teach of the system in claim 1.

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Abbel further teaches:

limitations from claims 2 and 3, wherein the vacuum pumping arrangement forms part of a semiconductor processing assembly (C. 1 Lines 12-33, semiconductor processing is a chemical/physical process), and the evacuation means (4) comprises a pump that is a pump for a load lock chamber (2, "gate chamber") of the processing assembly (C. 2 Lines 53-65);

limitations from claim 7, wherein the evacuation means (4) is for evacuating the vacuum pumping arrangement (C. 2 Lines 62-65);

Abbel and Stones disclose and teach of the system in claim 1.

Stones further teaches:

limitations from claims 5, 6 and 15, wherein the backing pumping mechanism (1) is a regenerative pumping mechanism (C. 3 Lines 16-18); and the molecular pumping mechanism comprises a molecular drag pumping mechanism (2; see C. 3 Lines 14-16);

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher et al (US Patent No. 6,161,576) in view of Stones (US Patent No. 6,135,709).

Maher teaches:

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limitations from claim 1, a vacuum pumping arrangement (see FIG. 1-3) comprising a vacuum means (roughing pump) connected to the arrangement to evacuate a turbomolecular pumping means (turbo-pump) before startup of the pumping molecular mechanism; wherein the evacuation means is decoupled from the molecular pumping mechanism during its normal operation (see C. 4 Lines 9-56, specifically Lines 37-44; C. 5 Lines 52-59);

Maher does not teach the specific structure of the turbo pump, but Stones does.

Stones teaches:

limitations from claim 1, a vacuum pump arrangement having a molecular pumping mechanism (FIG. 3) comprising turbomolecular pumping means (50); a backing pumping mechanism (1), wherein a drive shaft (the shaft mounted on the rotor 9) driven by a motor (7 from FIG. 1) is for driving the molecular pumping mechanism and the backing mechanism (C. 2 Line 61 to C. 3 Line 20);

It would have been obvious to one of ordinary skill in the art of vacuum pumps at the time of the invention to use a compound vacuum pump as taught by Stones in the system as taught by Maher in order to improve the operating range of pressures and throughput (see C. 1 Lines 4-7 of Stones). Furthermore, as Maher already teaches a turbomolecular pump, it would be obvious to one of ordinary skill to substitute various pumps of this type to meet performance (i.e. pressure) demands. Examiner also notes that while Maher does not teach a shaft explicitly, it is obvious, at the very least in the combination of Maher with Stones, that starting the turbo pump would require a rotation of its shaft.

Claim 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abbel (US Patent No. 6,446,651 B1) in view of Stones (US Patent No. 6,135,709) as applied to claims 1-3 and 5-7 above, and in further view of Olsen (US Patent No. 4,577,465).

Abbel and Stones disclose and teach of the method in claim 1.

Neither Abbel nor Stones teaches a specific type of pump to be used for the evacuation means (4 of Abbel), but Olsen does.

Olsen teaches:

limitations from claim 4, wherein an evacuation means (38) comprises an ejector pump (C. 5 Lines 40-60);

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to use an ejector pump as taught by Olsen in the system taught by Abbel and modified by Stones in order to avoid contamination from an oil lubricated pump, C. 2 Lines 20-30;

Abbel further teaches:

limitations from claim 16, wherein the evacuation means (4) is for evacuating the vacuum pumping arrangement (C. 2 Lines 62-65);



Claims 8, 9, 11, 13, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher et al (US Patent No. 6,161,576) in view of Stones (US Patent No. 6,135,709).

Maher teaches:

limitations from claims 8 and 9, a method of operating a vacuum pumping arrangement (see FIG. 1-3), the method comprising the steps of operating a vacuum means (roughing pump) connected to the arrangement to evacuate a turbomolecular pumping means (turbo-pump) to a predetermined pressure; and operating a motor to start rotation of the turbomolecular pump shaft when the pressure has been obtained (C. 3 Line 57 to C. 4 Line 8); wherein the evacuation means is decoupled from the molecular pumping mechanism during its normal operation (see C. 4 Lines 9-56, specifically Lines 37-44; C. 5 Lines 52-59);

Maher does not teach the specific structure of the turbo pump, but Stones does.

Stones teaches:

limitations from claims 8 and 9, a method of operating a vacuum pump arrangement having a molecular pumping mechanism (FIG. 3) comprising turbomolecular pumping means (50); a backing pumping mechanism (1), wherein a drive shaft (the shaft mounted on the rotor 9) driven by a motor (7 from FIG. 1) is for driving the molecular pumping mechanism and the backing mechanism (C. 2 Line 61 to C. 3 Line 20);

It would have been obvious to one of ordinary skill in the art of vacuum pumps at the time of the invention to use a compound vacuum pump as taught by Stones in the system as taught by Maher in order to improve the operating range of pressures and throughput (see C. 1 Lines 4-7 of Stones). Furthermore, as Maher already teaches a turbomolecular pump, it would be obvious to one of ordinary skill to substitute various pumps of this type to meet performance (i.e. pressure) demands. Examiner also notes that while Maher does not teach a shaft explicitly, it is obvious, at the very least in the combination of Maher with Stones, that starting the turbo pump would require a rotation of its shaft.

Maher and Stones teach and disclose of the method in claim 8.

Maher further teaches:

limitations from claims 11 and 13, wherein the vacuum pumping arrangement forms part of a semiconductor processing assembly (C. 1 Lines 12-17) having a pump (roughing pump) associated therewith which forms the evacuation means, further comprising the steps of connecting the pump to the arrangement (see FIG. 1-3) and operating the pump to evacuate the turbomolecular pumping means and the vacuum pumping arrangement to the predetermined pressure (C. 2 Line 61 to C. 3 Line 20);

limitations from claims 14 and 17, wherein the predetermined pressure is 500 mbar or less (C. 1 Lines 30-42 discuss the need for pressures of 1 torr or less, which converts to less than 500 mbar);

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher et al (US Patent No. 6,161,576) in view of Stones (US Patent No. 6,135,709) as applied to claims 8, 9, 11, 13, 14 and 17 above, and in further view of Arai et al (US Patent No. 6,474,949 B1).

Maher and Stones teach and disclose of the vacuum pumping arrangement of claim 8.

Maher teaches starting a turbo pump while running an evacuation means (roughing pump);

Neither Maher nor Stones teach limiting the torque of a motor during startup, but Arai does.

Arai teaches:

limitations from claim 10, limiting the torque of a motor (40), (Arai discloses controlling the speed of the motor, it would be obvious that speed and torque are closely related), to avoid an overloaded state, (C. 1 Lines 60-65 and C. 4 Lines 5-21);

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to combine the pump monitoring method as taught by Arai with the operating method taught by Maher and modified by Stones in order to create a more stable pumping arrangement.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher et al (US Patent No. 6,161,576) in view of Stones (US Patent No. 6,135,709) as applied to claims 8, 9, 11, 13, 14 and 17 above, and in further view of Olsen (US Patent No. 4,577,465).

Maher and Stones disclose and teach of the method in claim 8.

Neither Maher nor Stones teaches a specific type of pump to be used for the evacuation means (roughing pump), but Olsen does.

Olsen teaches:

limitations from claim 12, wherein an evacuation means (38) comprises an ejector pump (C. 5 Lines 47-48), wherein the pump is connected to a vacuum arrangement to evacuate another pumping means to a predetermined pressure (C. 5 Lines 40-60);

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to use an ejector pump as taught by Olsen in the system and method taught by Maher and modified by Stones in order to avoid contamination from an oil lubricated pump, C. 2 Lines 20-30;

### ***Response to Arguments***

Applicant's arguments filed 09/18/2009 have been fully considered but they are not persuasive.

Applicant's arguments with respect to the Abbel reference have been addressed in the modified rejection above. Specifically, the reference appears to teach (C. 2 Lines 24-31) that the fore-pump can indeed be decoupled from the high-vacuum pump without causing failure.

With respect to the Maher reference, the examiner believes that (C. 4 Lines 9-56, specifically Lines 37-44; C. 5 Lines 52-59) teach the decoupling of the evacuation means from the main pump (via the 3 valves discussed).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER BOBISH whose telephone number is (571)270-5289. The examiner can normally be reached on Monday through Thursday, 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571)272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Bobish/  
Examiner, Art Unit 3746

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